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Dear Sir:

Sylvania Electric Products, Inc., will construct "in the near future" for its atomic energy work a multi-million dollar production and laboratory facility, Don G. Mitchell, chairman and president, said last week in New York. Mr. Mitchell stated that sales and earnings of the firm, for the first half and second quarter of this year, set new records for any comparable period in the company's history. (Sylvania told the Joint Congressional Committee on Atomic Energy recently that it intends to construct a completely privately owned and operated nuclear fuel reprocessing plant as soon as the volume of fuel which requires such reprocessing is sufficient to make such a plant economically attractive. It estimated 1960 or 1961 as earliest possible date for such an operation. Meanwhile, Sylvania and an engineering firm are working on design and economic studies for this reprocessing plant.) (Other BUSINESS news, p. 2 this LETTER.)

Purchase of the Happy Jack uranium mine in Utah has been made by Texas Zinc Minerals Corp., a company jointly owned by Texas Co., and New Jersey Zinc Co. Substantial tonnages of uranium ore have been blocked out in this mine, Texas Zinc said. It has already started construction of a uranium processing mill at Mexican Hat, Utah, about 70 road miles from the mine. Uranium concentrates from the mill will be sold to the USAEC on a per unit price basis under a USAEC contract the firm holds. Completion of the mill is scheduled for September, 1957. Although no figures were given, it is estimated that Texas Zinc will have some $15 million invested in uranium by the time the mill is in operation.

An "abridged low-cost version" of its atomic energy course for management (fee: $190) will be given by the National Industrial Conference Board on Oct. 1-5, 1956, in New York City. Its "full scale" course had been given at the Westchester Country Club, in a suburb of the city. Further details from NICB, 460 Park Ave., NYC 22..... A series of special training and briefing classes, on legal aspects of atomic energy work, will be given for attorneys this Fall by the Atomic Law Institute, Mayflower Hotel, Washington, D.C. Further information from Bigelow Boysen, institute director.

Purchase of a 2 million electron volt Van de Graaff particle accelerator, by Compagnie Francaise de Raffinage, France, will enable the company to do fundamental studies on the effect of radiation on petroleum products, a CFR spokesman recently pointed out. The firm, large French petroleum refining and processing organization, bought the accelerator from High Voltage Engineering Corp., Cambridge, Mass. ..... Applications for USAEC 104c licenses have been filed by Lockheed Aircraft Corp., Van Nuys, Calif., and Washington State University, Pullman, Wash., to build and operate nuclear research reactors. The Lockheed facility will be for Stanford University, Palo Alto, Calif., while the atomic equipment division of General Electric Co., will supply the reactor for Washington State. And at Atomics International division of North American Aviation, Inc., fabrication has started on a 50 thermal KW water-boiler nuclear research reactor for Japan.

ATOMIC ENERGY BUSINESS NEWS...

NUCLEAR FIRMS PURCHASED: Half-interest in Applied Radiation Corp. (ARCO) Walnut Creek, Calif., has been bought by Archer-Daniels-Midland Co., Minneapolis. During the past 2½ years, ARCO, an organization staffed by nuclear physicists, has developed a new high power linear accelerator suitable for industrial processing; two units have been completed, with others under construction. ARCO also does contract irradiation at its Walnut Creek plant; users include drug manufacturers, meat packers, plastics manufacturers, etc. Early financial support for ARCO came from W.F. & John Barnes Co., manufacturer of automatic food and metal processing equipment, and a supplier to the USAEC. Although purchase price paid by ADM was not disclosed, ADM's $47 million working capital will allow expansion of ARCO's operations. Additionally, ADM's president Thomas L. Daniels explained, the firm is interested in the use of irradiation to prolong keeping qualities of foods, sterilize and kill insect life in grains, etc.

Aerojet-General Corp., subsidiary of General Tire & Rubber Co., recently acquired Applied Nucleonics Corp.; the new firm will be known as Aerojet-General Nucleonics. Following the purchase, Aerojet-General Nucleonics has now resubmitted to the USAEC the license application of Applied Nucleonics Corp. for a 100 milliwatt nuclear reactor. Of a unique design, this reactor would use 600 grams of 20% enriched uranium oxide particles embedded in a radiation-stabilized polyethylene moderator. The reactor is to be a prototype of future reactors to be offered for sale by the company for research purposes.

NUCLEAR POWER PLANT MAY BE DELAYED:- The USAEC's Advisory Committee on Reactor Safeguards, in a report to the USAEC, has pointed out certain design problems being encountered in the nuclear reactor to be used for the nuclear power plant of Atomic Power Development Associates, at Monroe, Mich. Because of these problems, the Committee has advised that experience with such a nuclear reactor should first be gained using a smaller-scale feeder prototype. This could cause as much as a 3-year delay in completion date of the 100,000 elec. KW plant, initially scheduled for 1960 by Atomic Power Development Associates, which comprises a group of firms headed by Detroit Edison Co. The Committee's report is considered by the USAEC preliminary to granting facilities, license and construction permit; no action has yet been taken by the USAEC on APDA's application for the documents.

CONGRESSIONAL ACTION TAKEN ON NUCLEAR PROJECTS:- Passed by the House in Washington last fortnight, and with a large measure of assurance of enactment, was the military supplemental appropriations bill allocating $30,139,000 to complete Canel Air Force Plant No. 2, Middletown, Conn., which includes facilities for developmental work on aircraft nuclear propulsion by Pratt & Whitney. Some $11,415,000 was allocated for nuclear aircraft testing facilities at the national reactor testing station, Arco, Idaho, where a 16,000-ft. runway will provide adequate take-off run for the very heavy nuclear aircraft now under development. Although the Army had asked $3,287,000 to build a nuclear heating and power "package" plant for Alaska, the grant actually given was $500,000 for preliminary planning and design, since the Army admitted construction could not be started until next fiscal year.

NEW FIRM IN NUCLEAR FIELD:- Prosperity Co., Inc., Syracuse, N.Y., has said that it plans ultimately to provide nuclear consulting services "across the board" in the nuclear field. The firm, manufacturer of laundry and associated equipment, recently applied to the USAEC for a license to build and operate a nuclear research reactor on the campus of the University of Miami, Coral Gables, Fla. The reactor would be of the swimming pool type, using 4-kg. of 90% enriched uranium.

CONTRACTS AWARDED, BIDS ASKED...for nuclear projects...

BIDS ASKED:- Bids are asked by the USAEC, Idaho Falls, Idaho, for construction of approximately 2-miles of railroad track at the national reactor testing station, Arco, Idaho..... Sealed bids are asked by General Electric Co., as agent for the USAEC, on several miles of mixed copper and aluminum high voltage surplus transmission lines at Hanford, Wash., plutonium production center.

CONTRACTS AWARDED:- Westinghouse Electric has received an $8 million contract from Consolidated Edison Co., N.Y., for the turbine generator for Con Ed's Indian Point nuclear power plant..... New York Shipbuilding has been awarded a $2 million contract by General Electric Co. for a welded steel nuclear reactor tank for the nuclear reactor GE is building for Commonwealth Edison Co's Dresden nuclear power station, near Chicago.

ATOMIC ENERGY FINANCIAL NEWS...

NEW FINANCING BY RECENTLY MERGED NUCLEAR FIRMS:- Newly-merged Baird Associates-Atomic Instrument Co., Cambridge, Mass., is issuing privately $750,000 of 5½% ten year debentures. Each $1000 principal amount of debenture will carry a warrant for purchase of 50 shares of common stock at 12 3/4 (until 1961) or at 14 (from 1961 to 1966). Of the proceeds of the new issue, $275,000 will be used to acquire new plant to consolidate operations of the combined firm, with balance of the proceeds to be added to working capital. Offering is being made through Chace, Whiteside, West & Winslow, Boston, and C. E. Unterberg, Towbin & Co., New York.

BLOCK OF SHARES IN NUCLEAR FIRM ACQUIRED BY MUTUAL FUND:- New purchases made in the 2nd quarter of this year by National Investors Corp., open-end mutual fund with assets of $65 million on June 30, 1956, include 5,000 shares of Vitro Corp., diversified nuclear firm, in addition to utility and airline shares bought by the fund.

PRODUCTS, PROCESSES & INSTRUMENTS...in the nuclear field...

NEW PRODUCTS:- New beta-gamma survey meter, model CS-30, provides full scale ranges of 0.2, 2, and 20 mr/hr., on a 4½-inch meter. The unit is housed in a magnesium case; the probe, which contains a CK-1021 Geiger tube, is slotted to expose the full length of the sensitive area of the tube. --NRD Instrument Co., St. Louis 14, Mo.

Trade-named Dustfoe Ultra-Filter, new respirator uses this firm's high efficiency filter cartridge which is said to be capable of providing protection against radioactive dust and air-borne organisms, toxic aerosols, and other dispersions. Weight is 6-oz., and the aluminum facepiece may be shaped by the user to fit the contours of his face. --Mine Safety Appliance Co., Pittsburgh 8, Pa.

PRODUCT DEVELOPMENT:- The design of its neutron generator is now being directed by Tracerlab, Inc. (Boston nuclear products firm) toward its use in oil well logging, as the result of a recent contract the firm received from Halliburton Oil Well Cementing Co., Duncan, Okla. The development work on the apparatus will use Tracerlab's improved discharge tube, which it is said, can produce useful quantities of 14 MEV neutrons, and on which Tracerlab has patents pending. (The tube also offers a relatively inexpensive method for production of short-lived radioisotopes; evaluation of sub-critical reactor design; analysis of materials for trace elements; etc.)

Loans totalling 11,000 pounds of ratural uranium metal, plus neutron sources, have been made by the USAEC to Mass. Institute of Technology, Cambridge, and The College of the City of New York, New York. The material will be used for teaching purposes.

PROCESSES: Some advantages of the membrane method of recovering uranium from various reagents were recently detailed before the 30th National Colloid Symposium by researchers from Rohm & Haas, where development work on the process is underway. The method, which uses electrochemical reactions applied in permselective membrane cells, results in an economy of reagents, and an improvement in precipitate characteristics, the Symposium was told.

Experiments with gamma radiation from cobalt-60 have shown it to be an effective method of inactivating Lansing poliomyelitis, St. Louis encephalitis, and vaccinia viruses, according to Russell T. Jordan, of the City of Hope Medical Center, Duarte, Calif., where the experimental work was conducted.

The use of ionizing radiation to sterilize sewage is now being studied at Armour Research Foundation, Chicago. Heat, in the form of steam, is the most common method now used. The investigations at Armour are being sponsored by the Army Chemical Corps.

Now in the planning stage is the Army Applied Ionizing Radiation Center, a project of the Quartermaster Corps. A $3 million nuclear reactor is to be furnished the Center by the USAEC, while the non-reactor portion of the Center, which the Army will design and build, will cost $4.6 million and will include a 20 mev linear electron accelerator. Said to be the first pilot-production-size facility for irradiating food, the Center will have a peak capacity of 1000-tons of foodstuffs per month. Completion is expected by late 1958. (Proposals are now being solicited from industrial firms, by the Army, for design of the facility, and for construction of the accelerator.) Among the studies the Quartermaster Corps. plans at the Center will be a comparison of the two radiation sources, accelerator and reactor, to determine their relative advantages for irradiating various types of foods, and other materials, for both military and civilian purposes.

THE IMPACT OF ATOMIC ENERGY ACTIVITIES OF MEDICINE & MEDICAL RESEARCH: Condensation of remarks by C. L. Dunham, M.D., Dir., Div. of Biology & Medicine, USAEC, at Rocky Mountain Cancer Conference, Denver, Colo., July 12, 1956.

The by-products and tools of atomic energy bid fair to making large contributions to medical science and the practice of medicine.

First, let us consider what is being done with radioisotopes in the treatment and diagnosis of disease.

Internists are using phosphorous-32 and other radioisotopes to treat a variety of blood dyscrasias, certain of the leukemias, etc. They use radioiodine to diagnose various thyroid states, and to treat hyperthyroidism and appropriate cases of thyroid cancer. Radioiodinated human blood serum is finding daily use in blood volume and cardiac output studies. For palliative treatment of generalized cancer of the abdominal or thoracic cavities, radiogold and radioactive chromic phosphate are effective in reducing fluid accumulation in an appreciable proportion of cases.

Neurosurgeons are finding radioactive iodinated human serum albumen and radioarsenic important tools in the diagnosis and localization of brain tumors. They have also used radioisotopes to study the dynamics of the cerebrospinal fluid and the intricacies of the mechanisms involved in the blood brain barrier.

Ophthalmologists find radiostrontium applicators useful in treating benign growths of the sclera and phosphorous-32 has been found useful in some clinics for localizing and in the treatment of intraorbital tumors.

Plastic surgeons use radiosodium to determine the adequacy of the blood supply in pedicle skin grafts. Genito-urinary surgeons use radiogold for interstitial treatment of prostatic cancer, and radiogold and other isotopes to treat bladder cancers.

In experimental studies aimed at controlling disseminated metastatic cancer by destruction of the pituitary gland, implantation of radioactive materials in the gland have been used by some as a substitute for precise surgical removal. Meanwhile, at Berkeley, the proton beam from the large cyclotron there is being used to accomplish the same result bloodlessly.

These, then, are some of the more readily identifiable contributions of the atomic age to medicine. Let us see what the demand for more knowledge about radiation effects on biological systems is bringing forth.

Take the problem of whole body radiation injury suffered by thousands of Japanese at Hiroshima and Nagasaki. One of the most important effects of a single large exposure of the whole body to atomic radiation is almost immediate, but temporary, suppression of bone marrow activity. There have already been uncovered a number of methods of reducing this effect if treatment is instituted prior to exposure. The amino acid cysteine, given a few minutes before exposure, reduces the effect by about half. Materials which injure the bone marrow, if given seven to ten days prior to exposure, so that the exposure occurs at a time when the marrow is just beginning to recover, have a similar sparing effect. Furthermore, embryo spleen brei, spleen homogenates, and bone marrow injections administered within a few hours after exposure, are also effective in promoting recovery.

May I point out that successful procedures for promoting prompt recovery of bone marrow damaged by radiation are bound to be useful in controlling some of the aplastic anemias encountered in day-to-day medical practice.

Cancer is the most important consequence of overexposure to ionizing radiation. This may occur in the form of leukemia as a result of overexposure of the whole body to radiation, as occurred in Japan, or it may be cancer of the bone (as in the case of "radium" dial workers), or cancer of the skin as happened to so many pioneer radiologists. We spend annually some three millions of dollars of our research appropriation for cancer research. This work is concerned with the cause, diagnosis, and treatment of cancer, making use of radioisotopes, high energy accelerators, betatrons, cyclotrons, and nuclear reactors. We are now building at Brookhaven National Laboratory, L. I., a nuclear reactor solely for medical research and principally to explore further the possibilities of using reactor-generated neutrons for the treatment of cancer. With improvised facilities at the present Brookhaven reactor, researchers there have used the neutron capture reaction of boron-10, introduced into the tumor via the bloodstream, to establish the feasibility of this novel method of giving radiotherapy to deep-seated tumors.

ATOMIC ENERGY PATENT DIGEST...industrial news of interest...

LINCENSES AVAILABLE:- New group of 51 patented inventions, developed under USAEC sponsorship in the course of nuclear development work, are now available from the USAEC Patent Br. Wash. 25, D.C., on a royalty-free (non-exclusive) basis. This new group comprises: (1) Device for obtaining very high vacuum in a large tank; 2,737,77. (2) Improved method of separating closely related flavonoid compounds; 2,738,346. (3) Liquid monitoring device to indicate radioactivity level in water; 2,738,426. (4) Purifying a metal such as uranium or thorium by electrolysis; 2,739,111. (5) Amplifier circuit; 2,739,237. (6) Current measuring device utilizing a single peaking transformer; 2,739,285. (7) Circuit for alpha survey meter; 2,739,286. (8) Production of purified metals such as zirconium, titanium, etc., by thermal decomposition of a volatile halide; 2,739,566. (9) Electrolytic cutting of metals; 2,739,935. (10) Preparing trialkyl borates for use in scintillation counters to measure fast neutrons; 2,739,979. (11) Production of uranium sulphate; 2,741,541. (12) Process for preparing deuterium oxide; 2,741,543. (13) Safety rod drive mechanism for a nuclear reactor; 2,741,592. (14) Fluid cooled nuclear reactor; 2,741,593. (15) Method of producing curium-243; 2,741,627. (16) Separation of zirconium salts from hafnium salts; 2,741,628. (17) Portable, highly sensitive, scintillation survey meter; 2,742,576. (18) Demountable filament assembly; 2,742,587. (19) Sewer sampler capable of taking liquid samples and rejecting solid material; 2,742,788. (20) Recovery of uranium by resin-in-pulp process; 2,743,154. (21) Process for producing anhydrous, substantially pure, thorium-alkali metal double halides; 2,743,155. (22) Recovery of uranium from phosphate rock; 2,743,156. (23) Re-extraction of uranium from organic solvents; 2,743,157. (24) Producing uranium pentachloride; 2,743,158. (25) Recovery of uranium from aqueous solutions; 2,743,159. (26) Improved method for producing anhydrous vanadium trifluoride; 2,743,161. (27) Purifying halogen derivatives of uranium compounds; 2,743,168. (28) Purification of halogen derivatives of uranium compounds; 2,743,169. (29) Solvent extraction equipment; 2,743,170. (30) Preparation of high purity metals; 2,743,173. (30) Titanium-uranium alloy useful in fabrication of fuel elements of nuclear reactors; 2,743,174. (31) Recovering uranium compounds from carbonate leach liquors; 2,743,222. (32) Organic compound bond rupturing process; 2,743,223. (33) Design of a thermal nuclear reactor submerged in a river or lake for both cooling purposes and radiation shielding; 2,743,224. (34) Solid fuel heavy water moderated nuclear reactor; 2,743,225. (35) Apparatus for bombarding samples with fast neutrons only; 2,743,226. (36) Electrolytic cells used in conjunction with production of uranium enriched with uranium-235; 2,743,228. (37) Arc welding device; 2,743,342. (38) Electronic analyzer for use with a mass spectrometer; 2,743,371. (39) Light weight portable container for radioactive materials; 2,743,372. (40) Measuring apparatus for magnetic field; 2,743,416. (41) Improved method of building the cooling systems of a nuclear reactor; 2,744,064. (42) Separation of flavonoid compounds; 2,744,893. (43) Binary counter; 2,745,006. (44) Ion producing mechanism; 2,745,017. (44) Apparatus for automatically regulating the ion beam in a calutron; 2,745,018. (45) Method of testing canned uranium slugs for defects in the can or weld closures; 2,745,279. (46) Cold trap type filter to remove sodium oxide crystals from a molten heat exchanger system; 2,745,552. (47) Arc regulator for calutron ion source; 2,745,964. (48) Calutron receivers; 2,745,965. (49) Fusible valve, useful for charging tubes containing uranium fuel slugs with helium to indicate possible leakage; 2,764,473. (50) Ternary zirconium base alloy containing tin and titanium; 2,746,861. (51) Inexpensive device for indicating attainment of peak voltage values; 2,747,126.

NEW INDUSTRIAL GRANTS:- Film badge adapted to retain a film pack sensitive to ionizing radiation. U. S. Pat. No. 2,753,460 issued July 3, 1956; assigned to Read-Curtis Nuclear Industries, Inc., Los Angeles, Calif. Inventors: C. W. Reed, A. Frisoli. (Application: Oct. 23, 1952.)

Atomic energy radiation meter. U. S. Pat. No. 2,753,463 issued July 3, 1956; assigned to Regents of Univ. of Calif., Berkeley, Calif. Inventors: P. R. Stout, C. C. Delwiche. (Application: Oct. 4, 1952.)

Sincerely,

The Staff,
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